

ABSTRACT

A plasma etching machine comprises a process chamber defining an interior region and including a bottom wall having an aperture and a block disposed in the aperture and including a longitudinally extending bore. A shaft extends through the bore and includes a spider push rod extending longitudinally therethrough. An internally cooled chuck is coupled to the shaft and disposed in the interior region and cooperates with the shaft to define a chamber. A spider is disposed in the chamber and is coupled to the push rod. A lift mechanism is coupled to the shaft and the push rod so that the spider pushes up on a wafer in response to actuation of the lift mechanism. A wafer clamping mechanism is coupled to the push rod if a mechanical clamp is used. In the case of electrostatic clamp the bias applied to the chuck is coupled with the use of a rotational roller to allow the bias to be applied to the chuck for the duration of the etch process. A RF source is needed for ionization of the gas. If the plasma etching machine has RF power applied through the bottom, then a rotational roller is used for this as well and must be isolated from the electrostatic voltage used to clamp the wafer. A drive motor is coupled to the shaft for rotating the shaft during a plasma etching process.